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The AMERICAN JOURNAL of OPTOMETRY

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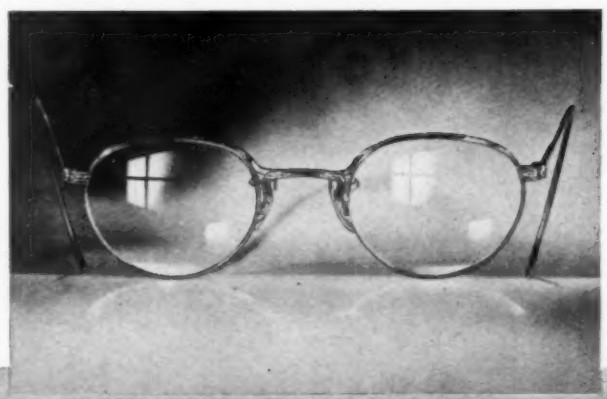

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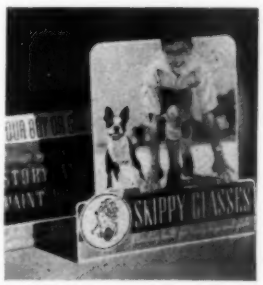

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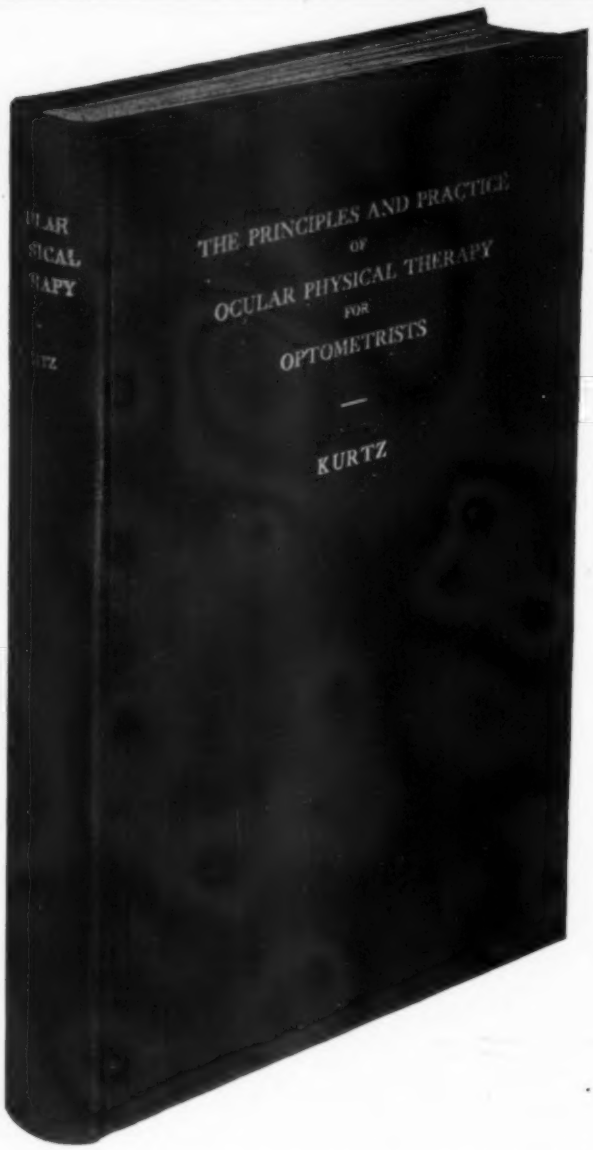

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AMERICAN JOURNAL OF OPTOMETRY

Vol. 14 AUGUST, 1937 No. 8

EMOTIONAL DISORDERS AND THE EYE*

Lewis H. Kraskin, Opt.D., F.A.A.O.
Washington, D. C.

PREFACE

It has been the experience of the writer to consult with patients, who presented eye troubles that did not respond in any marked degree to Optometric treatment. This offered a challenge and opportunity for a closer investigation.

The following is a synthetic study—an attempt to bring into focus the labors of many investigators in various branches of psychological research on the influence of emotional disturbances on the eyes.

The author will be rewarded if this humble study will stimulate the interest among his colleagues to view the human eye in its relation to the "person" and not merely as an organ of sight.

1.

Life is a continued process of birth and death, of coming into being and disappearing. In his life upon earth man has left us with the objects, implements and inventions which he used in the stuggle for survival and this furnishes us with the material of primitive civilizations. Not only in the material fields have the past generations bequeathed to us their acquisitions but also in the fields of thought. Religious, folk-lore, and myths are in a sense the cultural fossils of the great past.

The eye has always played an important role in the thinking of man. No other organ has been used in allegory, in parable and paradigm, as the eye.

In the great book, the Bible, we find striking verses touching on the eye, as the following:

"Mine adversary sharpeneth his eyes upon me."

"Mine eye also is dim by reason of sorrow."

"Mine eye wasteth away because of grief."

"Keep my law as the apple of thine eye."

"The wise man's eyes are in his head, and the fool walketh in darkness."

---

*An abridgement of the material presented before the American Academy of Optometry at Chicago, Ill., August 25, 1936.

"The light of the body is the eye; if therefore thine eye be single; thy whole body shall be of light." And in writers of a closer period we can find remarkable expressions as the following:

"That fine part of our constitution, the eye, seems as much the receptacle and seat of our passions, appetites and inclinations as the mind itself; at least it is the outward portal to introduce them to the house within, or rather the common thoroughfare to let our affections pass in and out. "Love, anger, pride, and avarice all visible move in those little orbs."—Addison. "One of the most beautiful things in nature is a glance of the eye; it transcends speech; it is the bodily symbol of indentity." Emerson. "Faster than his tongue did make offence his eye did heal it up."—Shakespeare. "Sweet, silent rhetoric of persuading eyes." Davenant.

People with beautiful eyes have been thought to possess great personal charm and health. On the other hand, a weak and ugly eye exposed the individual to much social discomfort.

The eyes were not only thought to possess charm and health but also a mysterious power and down to our own time, we can find people who hold tenaciously to the belief that there are individuals with peculiar eyes whose mere glance causes destruction.

I heard a Hindu Yogi remark that there are in India individuals who possess supernatural power in their eyes that a mere glance on a running train, will halt locomotion.

The deep belief in the "evil eye" mostly possessed by females has given rise to an elaborate system of enchantment, incantation, mystic rites and amulets.

2.

Optometry as an art and science deals with the eye, its function and defects and is dependent upon science. The most perfect satisfaction which one can have in Optometry comes through the thorough study of one special chapter in every direction and from every point of view—clinical, psychological, histological, physiological and pathological, etc., never forgetting that Optometry was the intellectual home in which we grew up: and even the emigrant best understands and is best understood by his native land. Advances in the different sciences directly affect our profession. Medicine in terms of "healing" is fundamentally an art based on the natural sciences, especially chemistry, physiology, psychology, etc. The progress of Optometry, like medicine, then is definitely related to the progress in the sciences on which it rests. Thus, we find science has contributed to healing professions in accordance with its growth and prestige; physics in the 18th century, biology in the 19th, and psychology in our day.

The medical practitioner observes many patients who, indeed, are sick and yet do not present structural pathology, but very definite functional disturbances. He, being trained to view his patients from a strictly physical background, finding nothing physically wrong, calling the con-

dition nervousness, would dismiss the patient, advising him not "to worry," to rest, etc. That the patient is incapable to exercise his "will" not "to worry," the doctor does not suspect. The more advanced minds in the profession, being dissatisfied with such a view, have turned their attention and launched out in a new realm of investigation that brought remarkable fruit—the understanding of these functional disturbances—the field of psycho-therapy.

As far back as 1908 Shepherd Ivory Franz, Ph.D., wrote: "At the present time I desire solely to emphasize the importance of keeping in mind the fact that there are some ills not yet correlated with bodily changes, that the causes of the conditions are often intra-bodily and that neither medication nor surgical operation are indicated. These pathological conditions are now known to be matters for careful psychological study and treatment, not for symptomatic prescription." (1) Since the day when those words were written tremendous progress has been made in psychology. We have obtained an appreciative knowledge of man and his psychic-life. He is not made up of a body and a soul, he is not broken up in many faculties, but emerges as a Unity. Man is one. The bodily and mental functions are processes of one and the same organic individual. These are inter-related and influence each other. Just as a bodily condition can call forth peculiarities of a mental nature, the same way a mental condition causes and calls forth peculiar conditions of bodily activity. We go further and say with Dr. William A. White that "the body may truly be thought of as only a group of instrumentalities for carrying into effect the dictates of the mind."

Scientists from the day of Charles Darwin (2) have demonstrated the influence of emotion on bodily activity, and the work of W. B. Cannon of Harvard (3) on the same theme is of worthy consideration. But it was left to that great physician and still greater man, Sigmund Freud, (4) explorer of untamed jungles in the human spirit, and his colleagues to demonstrate the tremendous influence of the psyche in healthful behavior and especially in abnormalities. It is amazing to know what expressions in bodily symptoms a psychic trauma; i.e., the conflict or strong unconscious wish, will create. For, indeed, a symptom is only the expression, the symbolic word of the trouble beneath the surface. The optometrist is faced with many such individuals—individuals who are emotionally sick, having eye difficulties, who suffer from poor vision, convergence-accommodation difficulties, pain, headaches, dizziness, squint, vomiting, tics, strain, neuralgia, migraine, hysteria, etc. True, the properly fitted lenses or orthoptic training will at times ameliorate these difficulties, but only for a short duration and the troubles assert themselves again rather puzzlingly. The optometrist who is trained in abnormal psychology will immediately discern that he is dealing with what is known as a neurotic personality, therefore, when practicing your profession remember that the patient is the target, not the bow and arrow. Do not play with him. Think without prejudice; consider with narrowed eyes.

Neurotic personality in Dr. Carl Menninger's words "is one whose primitive instincts have been modified to social demands only with painful difficulty." The individual is emotionally not adjusted, full of inner stress, and tension—the process of the psychic life impeded. The same author speaks of a few types of emotional distortions: "(A) Schizothemic or inappropriate responses, (B) phobias (morbid fears), (C) anxiety states and (D) preversions of affection and interest." (5)

The eye is peculiarly sensitive in neurotic individuals and is a source of much difficulty. The "eye" is quite often the reflector of the disturbance of the personality. For it should be borne in mind that "vision" is not accomplished by the eye itself. To be exact, it is the individual that sees and focuses his eyes in the direction and on objects that he desires. Psychic disorders are personality disorders and bring about a concomitant condition in the function of vision.

3.

Psychotherapy—the theory and practice of curing disease by measures of mind has been practiced from ancient times. In the past it was spoken of as "miraculous healing," "faith-cure," "animal magnetism," "exorcism," supposing that disease was caused by a demoniac possession. In our time there has sprung into existence an entirely new Christian denomination, i.e. (the Christian Science church), which has taken health as its central dogma. In this connection, it should be pointed out that all these healing cults are based upon the belief of the supernatural origin of mind and of man as possessing an intangible, ethereal entity-spirit. Modern psychotherapy, on the other hand, is scientific and conceives mind as a functional manifestation in organic constitution, definitely related to the central nervous and endocrine systems, finding its highest expression in consciousness. Mental life is purposive, adoptive in the upward climb of organic differentiation found most striking in man. A mental disturbance is a bio-chemical disorder in its essence.

The unique power of mind on physical processes has not been better demonstrated than in the phenomenon of suggestion, of which a few examples will suffice. Psychic suggestion has caused bleeding from the skin—Burot, Mabille, Hulst, and others; that it has caused blisters and marks like burns—Drs. Kraft, Ebing and Jendrassik of Budapest. Has excited and arrested menstruation—Garvel. It also has accelerated, slowed or temporarily arrested respiration, and Prof. Henry C. McComas of Johns Hopkins University states: "Thus I have seen a boy told that he was in the sun on a hot day and he broke out in a perspiration. Another youngster was told that the lobe of his ear was very cold and that there was no blood in it. When a needle was thrust through the lobe not a drop of blood exuded." (6) Dr. J. Milne Branwell, an authority on hypnotism, had seen the range of vision both distant and near increased in subjects whose sight was abnormal. Vision responded to psychic conditioning. Dr. Oertal reported a case of a young man 22, suffering from

subnormal vision in O. D. which only responded to light, and convergent squint, but under hynotism eye became straight and vision normal.

Dr. Menninger speaks of two cases in which the eyesight has been corrected by proper lenses but patients still experienced eye difficulty, because of their psychic sense of inferiority which focused itself in the eye.

In spite of all our advances in optometrical knowledge, it is still true that it is more important to know what sort of patient has a defect than what sort of defect a patient has.

Young man, 29, has been a patient of mine for many years. During the last weeks of school his eyes "just went wild." They blurred, ached, burned, were tired and as he expressed it "they absolutely refused to focus." A thorough general and optometric examination proved negative. Upon investigation I found he was working under great emotional strain —writing a theological thesis containing material falling short of his sense of intellectual integrity, hence the psychic conflict and the "eyes" just refused to function as a protest. But upon completion of the thesis which caused the conflict, his eyes improved immediately, and have remained so for the last three years.

Girl, 17, came for an eye examination relating that only recently her eyes began to trouble her; burning sensations, aches at turning eyeballs, and at times she was seized with fear of becoming blind because of sudden blurring of her vision. General physical examination was negative. Optometric examination showed only a very slight error of refraction. That suggested the source of her difficulty might lie in a different realm. Upon becoming acquainted with her domestic milieu, light was shed on the problem that determined the cure.

I found that her eye difficulties appeared in connection with a new individual who began to visit her home. That was a man who called on her mother (her mother's sweetheart) for her parents were separated. The girl resented this very much but was helpless in changing the situation. Her eye difficulties then reflected this situation and found expression in her words, "I hate to see him." This powerful hatred, not finding expression toward the person who generated it, turned on her and punished her "eyes," so that she may not see the hated individual, as she only experienced her eye difficulties when this man visited her home.

With the understanding of her personality make-up and the meaning of her "disease" she was enabled to adjust herself intelligently to her domestic situation, and within a very short time afterwards her eye difficulties cleared and have remained so for the last two years.

The child as a patient presents problems of a unique nature. In treating adults one at least expects a certain amount of cooperation, from some more, others less. With children the optometrist may expect very little cooperation, if any at all, for the eye symptoms of the patient may be of a desired or unconsciously motivated etiology.

I am certain that many are aware of a type of child-patient brought to us who present many nervous-behaviour anomalities in addition to his eye difficulties. Because of the child's immaturity and "natural" sense of inferiority to his adults we do not receive his full cooperation in treatments. With such children the optometrist, who also understands psychology, will endeavor to gain the parent's cooperation. In other words, he will consider the parents and home surroundings as factors in the child's maladjustment and return to normal activity. In order to come to a satisfactory understanding of the child's difficulties the optometrist must obtain a clear and comprehensive life-picture of the child.

Nathan Berger in the International Journal of Individual Psychology, Vol. I, No. 4, Fourth Quarter, 1935, reports a case that illustrates our point of view.

A case of eye disorder which did not yield to treatment until psychology was applied brought home to me strikingly the efficacy of that method of therapy and its importance as part of the routine of the doctor.

Every doctor has to cope with numerous complaints which cannot be traced, even with the help of exact laboratory tests, to organic or somatic bases. The suggestive and definite symptomatology which this class of patients manifest remains baffling and misleading to the practitioner who does not take into account psychological factors. Frequently the doctor in such cases realizes that the symptoms are exaggerated and without organic basis, but is at a loss when it comes to pointing out the genuine etiology of the condition.

Subsequent to the case to which I have referred with the history which I shall here relate, many others of the same nature, though perhaps not so striking, have come for treatment. And the cumulative impact of the results obtained in all of them has impelled me to attempt an active interest in psychology among the members of my profession.

Howard, a nine-year-old boy, was brought to my office in November, 1930, to have his troubling eye condition treated. His mother explained that not only his eyedids had been twitching but also his mouth and head. For the previous six months he had been under the care of his family physician, of a pediatrician, a neurologist and an ophthalmologist —all of them capable representatives of their respective fields—none of them had been able to effect more than a slight improvement in the boy's condition. During the course of the treatment by these physicians the boy had been kept out of school for several months. But as soon as the treatment had been discontinued all the original symptoms had reappeared.

A physical examination revealed Howard to be well nourished and well developed for his age. He also proved to be exceptionally bright and responded intelligently to all questions. Laboratory and other tests for specific maladies and disorders were negative. The blepharospasms which he showed had been accounted for by the presence of a foreign body on the right cornea. He had also a mild catarrhal conjunctivitis and a low degree of compound myopic astigmatism. With the aid of proper glasses

his vision became normal. The twitching of his mouth and head which the neurologist classified as "atypical chorea," indicated no definite neurological entity. The usual treatment for the eye condition had been instituted. The foreign body had been removed, glasses had been prescribed and eye drops ordered. No foci of infection could be located.

In March, 1931—five months later—Howard showed up again with practically all his old complaints. A checkup of his eyes revealed no "physical" condition to account for the continuation of these symptoms. The corneae were clear; the conjunctivae were normal; the pupils reacted well; the extra-ocular muscle balance was normal, and no appreciable change in refraction could be noted.

In 1932—the following year—these examinations were repeated with the same results.

In 1933 I became keenly interested in psychology; consequently when the boy under consideration appeared for re-examination in the spring of that year, and I made further attempts to probe his unsolved symptoms, I employed a whole body of, to me, new knowledge with the results that I shall presently explain.

A fundamental finding of psychology is that in order to understand a patient we must unveil his whole style of life. Questioning in this case with that end in view, brought forth the following information:

Howard, twelve years old, is the oldest of the two children in his family. The other child is a girl of seven. The boy volunteered the information that his sister was quiet and liked by the parents and that he was considered the "bad boy" of the family. The mother readily acceded to this in the boy's presence.

At school his conduct was only fair, though better than at home, but his work proved satisfactory to the teacher. The twitching of his eyes and face, however, distracted the attention of other pupils from their work and upset the morale of the class.

His earliest recollection was: "When I was a baby my mother left me on a chair. I fell off. Then my mother put me to bed."

The mother explained that because Howard was in the habit of eating very rapidly and causing a great deal of unpleasant comment at the table, his father had insisted that he (Howard) eat in the kitchen alone. She declared that she found it necessary to wash his face and hands, comb his hair and help him dress in order to get him off to school. Moreover, he was very unruly; and both parents have had to resort to corporal punishment in order to make him behave. All this has been going on for years.

The sister, on the other hand, was well behaved and always sat at the table between the father and mother at meal time. Both of the parents appeared to be intelligent, alert and motivated by good intentions. They tried to do what, in their judgment, was best for the boy. The mother attended to all her household duties. She was a good cook

and housekeeper. The father, who was in the silk business, frequently found it necessary to put in unusually long hours at his store. Thus he often came home tired and irritable—in a word, in no frame of mind to tolerate Howard's noise and disobedience. On such occasions he was in the habit of confining the boy to the kitchen while he remained in the living room reading the newspaper with the little girl near him.

Glancing back to a period preceding the one we have been dwelling upon we find Howard, for five years, enthroned as the first born and only child and exclusively commanding the attention of his parents and relatives. Living in such a highly favorable environment for five years he became accustomed to it and formed his style of life accordingly.

Then something tremendous happened in his "world." Another child, his sister, arrived in the family. Some of the attention which had previously been showered upon him now began to be "usurped" by the newcomer, the "intruder." He felt "dethroned." To his childish mind it seemed that he had been deprived of what rightfully belonged to him and that the cause of it all was the sister.

Casting about for ways by means of which to regain the attention that he had lost he apparently had hit upon, and found "success" in, twitching his eyelids, mouth and face, and in eating noisily. Thus we see, as psychology has found in innumerable cases, that a "dethroned" child will go to great lengths and endure most trying discomforts in order to gain attention and tyrannize over his environment. The case of Howard shows how ingenious an alert child can be in accomplishing this. Incidentally, we can understand that his condition improved slightly because he was receiving the attention which he craved when his mother accompanied him while he was being treated by the various doctors.

That our analysis of his attitude toward his sister is correct is borne out by his characterization of her. In response to our questioning, he said: "She's all right, but she's a pest."

Now, let us return to Howard's earliest recollection. What does his remembrance of having fallen off a chair signify? It is an indictment of his mother for the "laxness" of her care of him. The pampered child demands more and more pampering. That at the age of twelve his mother still had to wash and dress him is telling evidence of this pampering. There is to be considered also the seemingly contradictory but fundamentally consistent attitude of being in "hostile territory," of being, as he put it, the "bad boy of the family." Feeling himself to be unloved and in an "enemy camp" it is small wonder that instead of cooperating he rebelled—that is, he did the reverse of what his parents desired of him.

In the light of all this, I became convinced that the way to treat a case like Howard's effectively was to reveal his mistaken style of life to him, to his parents and other persons who constituted major influences in his environment, and then with their aid to change Howard's self-centered attitude to one of cooperation and social participation. I explained the situation over and over again to the parents.

The parents were requested to acknowledge to Howard that they had misunderstood his motives and to apologize for having mistreated him. They were asked to explain and to indicate frequently in a nice friendly way that they loved him as much as they loved the sister. It was impressed upon both the parents that mere words are insufficient and inadequate in this connection; that it would be necessary to convince the twelve-year-old boy thoroughly of his equal status in the family by repeated and unmistakable acts of kindness. I pointed out that it was imperative that the boy eat at the table with the rest of the family and that his facial movements be completely ignored so that he might realize the futility of these movements as a weapon of attack or retaliation. Corporal punishment, along with tongue lashings, were to be abolished forever. The father and mother were advised to speak to Howard in the same manner as they would use in speaking to their best customer, even though the customer were irritable and made derogatory remarks about their merchandise. It was impressed upon them that they must always maintain an attitude of consideration and friendliness.

I then turned to Howard's teacher and, by means of the following letter, sought her active cooperation in the case:

"March . . . ., 1933.

"My dear Miss S. . . . . :

"Howard R. has been under my care for his eyes since November . . ., 1930. The boy has compound myopic astigmatism, commonly known as near-sightedness. However, with glasses which I have prescribed the boy obtains 20/20 vision, i.e., very good.

"The peculiar movements which the boy exhibits in the muscles of his face are due to a desire on his part to gain attention—rather than to an irritable condition of the eyes. I have gone into the family history and find that he is the first born and has a sister five years younger. Examining the boy from a psychological point of view, we discover that he is a "dethroned" child and makes every effort both at home and in school to concentrate the attention of others upon himself. I have explained this to the child's parents and they have promised to cooperate in every respect to make Howard feel he is as much loved and admired as his sister. As to his behavior at school I might suggest that, were I the teacher, I should tell him, 'Howard, you can twitch your face and eyes as much as you like. I don't care.' In this way the child would be made to realize that it does not annoy you and he will not longer use this means as a method to seek the limelight. I should also be lenient and very friendly toward this child, and make him feel that he is appreciated and liked. . . .

"I feel apologetic for outlining the above course of treatment since you are undoubtedly well posted in the psychology of children. But if a suggestion here and there will help this child my efforts will have been worthwhile. Thanking you for your kind cooperation, I remain, ..."

As for my handling of the boy himself, I agreed with him that in some respects he was justified in concluding he has been mistreated. At

the same time I impressed upon him the fact that his father was a hard working man and often came home very fatigued; consequently, he should make allowance for the father's irritability on such occasions in view of the fact that it was due to his efforts to make possible a comfortable home and livelihood for the whole family.

Since the conferences with both parents were held in the boy's presence, Howard was favorably inclined toward a reconciliation with them. I suggested to him that he might perhaps like to show his renewed affection by buying his father a gift of some small article of apparel—the idea being to transfer his concern from himself to another member of the family. At one of the conferences, in the boy's presence, the parents agreed to give Howard a regular weekly allowance of twenty-five cents to be spent at his own discretion—the idea of this being to develop independence and initiative. Again, the mother's necessary occupation with her routine of duty was explained to him in order to make him realize that she did not have time to take care of his immediate personal needs, i.e., dressing, washing, etc.

Two weeks later the mother reported that the boy had presented his father with a pair of bedroom slippers, and that in general he had begun to show that he felt at home in the family and understood the need and significance of cooperation.

Since then the family relationship has steadily become more and more friendly. In March, 1934, a year after the general reconciliation on a psychological basis, Howard came in for his periodic examination, and while the boy was in the reception room the mother declared that there had been no recurrence of the symptoms throughout the year. She said that Howard had become a "new boy." She added further that the diagnosis of Howard as a "problem child" had been incorrect; that the diagnosis should really have been "problem parents."

Vision is a complex process. A description of it by Madison Bentley of Cornell University is given in the following words: It deals "(1) with the visual apparatus both as a dioptric or refracting mechanism which conveys light rays to the retina and as a nervous organ which transforms the vibratory stimulus into neural excitation and transmits it to the bearer; (2) with the sensations of brightness and color as regards their quality, number, classification, etc.; (3) with the specific processes which underlie and condition visual sensation, and (4) with those perceptions of things and events which come to mind through the avenue of sight."

Remembering also what I have previously said, that an act of vision means not only that the "eye" sees but the person sees "with the eye," hence it follows that persons with disturbed and shattered emotional responses should present complicated and unique material that may seem to those, not familiar with this field, incomprehensible and incredible. All life is expression in certain definite patterns. Normally, a man expresses his ideas, feelings, joys, sorrows, and hopes by means of his phy-

sical equipment. Abnormalities in similar manner find their expression by organic means and dissociated experiences break through unconsciously, the veneer of consciousness. Normally, the eyes are also used to express symbolically states of affection, as for example, "I could just eat him up with my eyes," said a mother of her charming baby. "My eyes were just glued to the window," are words of a woman looking at the window of a jewelry store longingly. "I cannot take my eyes off my husband," said a young married woman, experiencing the power of erotic attachment.

A "neurosis" has its organic expression, its "organ dialect." It is a familiar experience of many people to manifest the feeling of disgust, in emotionally charged situations, by vomiting. This is what is meant by the psychological effect. Neuroses are variously related and expressed in definite organic symptoms. William A. White, M.D., superintendent of St. Elizabeth's, Washington, D. C., corroborates our point of view by stating, "The symptoms of mental disease can thus be understood as the outward evidences of attempts at adjustment, made difficult by some psychological conflict and the language of the symptom, so to speak, can be translated when it is understood as expressing reactions of escape, defense or compromise in the face of the problem presented."

Now, I shall bring a number of cases that show the complexity of neurotic symptomatology relating to vision. The case I am about to cite to you will stir the imagination of the thinking and studious optometrist, though vague he may think its history purports.

The difference between myopia and pseudomyopia is clearly comprehended physically. That pseudomyopia, has been caused psychically as a moral punishment to the eyes for desiring "to see" that which "isn't right," is demonstrated in the following case history:

The Voyeur's Story

"I never liked a girl with glasses until recently. Don't recall anybody; yes, my father's father wore glasses. Remember him blowing his breath on them. He was the one that gave me a spanking for yelling so loud. . . .

"Always interested in telescopes and opera glasses. I was very young, ten; I took mother's opera glasses to look through—up and down the street—it was in the city. It was the wish to see how far I could make things out with them. At fifteen I sent away for a telescope, cost me $1.25. Mother had to pay for it, I didn't have the money. Count cattle twenty miles away and all that stuff. I couldn't see beyond the street on account of the houses Can't get away from mother and sister; can't see my way clear because of them. Used to try to read the house numbers —might have been the origin of my looking at auto numbers now. Number on apartment house—I tried to make it out and never could, then tried those nearer. Number would be vagina.

"In school, histology, used miscroscope, hour after hour, and my eye became inflamed—but I always had to use the right eye, the left eye

was too weak. In other words, I couldn't focus the left eye. Punishment for my desire to use the left eye, to see the mother's vagina. Question of right or wrong, brings me right back to the religious complex. About eight, I remember seeing it, on my cousin when she was a baby. Hadn't come to this town yet—my aunt had my cousin on her lap—changing her diaper on her—could see the vagina very plainly. Very deeply interested. I stared. Sense of guilt after that. She happened to look up and see me looking. She said, 'What are you looking at?' She and my mother and the others in the room laughed at me, made me feel cheap. Remember that incident plainly.

"About ten, when I went bathing with a man here in town; we were in one dressing room together. When we came to undress he had his back to me all the time—wart or mole on his left side. Curious to see his penis but didn't get a chance to.

"When I was in the first grade, girl brought a cardboard with red gelatine. I wanted to look through but they wouldn't let me. Curious as to what they saw through that. That was the time I thought I needed glasses. Always curious about each other's organ—sister, cousin, and aunt —and examined them—at that time wanted to kiss or smell my aunt's and her older sister caught us. . . ." Daniel A. Huebsch, PhD., in Vol. 18 of the Psychoanalytic Review, 1931.

This patient was myopic, with poor distant vision and a great deal of discomfort which glasses did not relieve. His eye difficulties could not have been cured with glasses for the root of the disturbance was instinctual (sexual). Hence, when psychological factors were removed, the eyes became normal.

Blindness as a Wish

(Based upon material furnished by Dr. Thaddeus Hoyt Ames published in the Psychoanalytic Review, Vol. I, 1913.)

Man, 30 years of age, in the best of health, one morning awoke blind. His eyes hitherto never gave him any trouble. During a period of ten weeks he was submitted to various medical examinations. Physicians pronounced the fundi and pupils normal, but there was only slight perception of light but not of objects. An examination of the nervous system also failed to show any lesions.

Because of the absence of physical factors the blindness was considered to be "hysterical." An attempt was made to unravel its motivation.

Patient declined to discuss his problems and worries, but spoke much of his dreams. Dreams revealed much light on his life, namely, that the 15 years of his married life were unhappy and he often wished to be away from his wife—*not to see her.*

When his dreams were explained to him he admitted consciously that he often wished not to see his wife and now "he felt really glad

he could not see her even though she was near him." His blindness was purposive and brought about a change in both of their attitudes.

Upon realization that his blindness was the expression of his desire not to see his wife, and that by being blind he gratified his desire and it had also effected a change in her attitude toward him, the idea occurred to him that if all he wished was not to see her, he could find less inconvenient ways than by remaining blind. Instantly, the blindness disappeared. He picked up a newspaper. He read it. The cure occurred four days after his entrance to the hospital. A day or so later he wrote a letter to his wife saying he was coming home. Furthermore, he said, he went willingly, and his eyes remained normal to date.

Dr. Smith E. Jelliffe, in his investigations, was impressed with the occurrence of myopia in boys and girls at the age of puberty. This, he felt was not an accidental phenomenon and his studies seem to imply the definite relationship between myopia and sexual development.

Myopia began about 12-14, preceded by masturbatory activities. Cohabitation at 21. Myopia advanced steadily and at 18-20 years it was very stable. Patient had about 4 to 5 diopters of myopia. The author goes on to show in a detailed manner with analysis of many dreams of the patient how his "myopia" is related to disturbances in his instinctual—social life.

"Bodily disease may constitute the sacrifice for mental, i.e., herd conformity—which when failing may permit a severe withdrawal from the herd either by suicide or any of its less radical substitutes." (The International Journal of Psycho-Analysis, Vol. 7, 1936.)

In other words disease of psychological origin is an escape mechanism. Should the escape prove unsatisfactory the individual may be led to self-destruction.

Dr. W. S. Inman, writing in the British Journal of Psychology (Medical Section) Vol. II, Part I, October, 1921, emphasizes the relationship between eye difficulties and periods of emotional stress, as for example, the period of adolescence, pregnancy, change of vocation or residence, conditions which call forth necessary and new forms of adjustment.

Intelligent woman of 38 suffered with pain in the eyes for a period of several months. Difficulty in reading also experienced. Ocular examination revealed only one diopter of hypermetropia, but correction by glasses did not relieve her. Such a defect may be considered congenital and there are numerous individuals who have such an error and feel comfortable. Another thing, this woman had never before suffered with her eyes. What is then the reason of her present susceptibility.

Her life story revealed a disappointment in her husband and at this time she began to be very conscious of her ocular error and suffered from it. With the bringing about a marital adjustment she responded

to life so fully that her "eyes" ceased to be a hindering factor. Her eye difficulty was brought about by emotional stress.

Girl 18, complaining of severe ocular disability. General examination negative. Eye examination revealed an error of refraction of one D. of hyperopia, but glasses did not relieve her. Asked to tell something about herself she broke out and related a tragic experience. Her father outraged her and the stepmother attempted to stab her with a knife. And the author asks, "What is the use of correcting one diopter of hypermetropia with a pair of glasses in such a case? Her symptoms disappeared after one week of psychological treatment and did not recur for a year." What is known as a "psychological catharsis" brought about a state of recovery.

Devout Roman Catholic girl of 23 began to experience eye troubles. Her refractive error was not sufficient to explain her pain. She explained that she experienced pain in the eyes since she fell in love with a priest. Made confession to her parish priest and was told it was a great "sin" and had been admonished and made terribly unhappy. The author attempted to encourage this young woman that she turn her interests in a secular direction and praised her capacity "for a pure affection for a good man." Her symptoms immediately disappeared with the regaining of her self-respect and confidence.

As we have pointed out previously, Dr. Inman also emphasizes the fact that individuals who suffer with their eyes suffer also nervously and mentally.

"In order to determine what proportion of the cases had other than ocular symptoms," Dr. Inman writes, "I asked all patients who came to me for glasses, if they suffered from insomnia, depression, cold extremities, and giddiness, and in order to get some idea how they spent their unconscious hours, to what extent they dreamt. One hundred consecutive cases gave the following results:

"13 were males, 87 females. This sexual disproportion is very significant. Six were under twenty years of age, 19 were between twenty and thirty, and 75 were thirty years and over.

"Headache. In 16 headache was not complained of. Eighty-four were affected, five very severely; the pain was often associated with other symptoms of migraine.

"Insomnia. Only eight were satisfied with their sleep. Sixty-nine slept badly. Twenty-three slept heavily, but were not refreshed afterwards. Morning headache was common in the heavy sleepers.

"Depression. Ninety-three patients complained of this symptom, and seven of them described it as very severe. In most of the cases the depression was of such a character as to make the patient eloquent upon the matter.

"Cold extremities. Sixty-one suffered from cold hands, and 78 from cold feet. A history of chilblains was common. Hot hands occurred in

five cases, and hot feet in three. One woman who complained of cold hands, was much troubled by hot feet. It frequently happened that on the coldest nights in winter she was compelled to push her burning feet outside the bed clothes, before she could get to sleep. This unequal action of the vasomotor system needs further investigation.

"Giddiness was present in 60 cases.

"Dreams. Forty-four patients stated that they dreamt much, 35 only occasionally, and 21 said they never dreamt. It was noticed that the bad sleepers usually had nightmare, whilst the dreams of the heavy sleepers were generally of the innocent variety."

Young lady of 26 consulted Dr. Inman in February. Complained of headaches and her eyes were aching after reading for a short time. No change in the refraction since five years previously, when examined. She also experienced abdominal pains and was in a nursing home for two months. Was thought to have appendicitis. Previous to that she had neuritis. In trying to attempt at a coherent life history patient did not cooperate, nevertheless, the "emotional component" of her ailments was obvious. It is of interest to notice that since her marriage she has been in good health.

The entire study of Dr. Inman points to the realization that emotional stress of some sort will cause constitutional disturbances of a complex nature, in which vision is involved.

Man of 58 developed acute glaucoma upon return from his mother's funeral.

Unequal pupils.

"The action of emotion on the pupil of the eye is common knowledge, but the *nature* of the emotion is not always recognized. The following three unusual cases taken together point to a new field of research.

"Some months ago a man of thirty-five was sent to me because of unequal pupils, giving rise in the mind of his doctor to fears that serious disease of the central nervous system was beginning. He was a man of much vitality and energy, who had been wounded four times in the great war, and had escaped all nervous symptoms, except a stammer of a fortnight's duration after being shot through the stomach. In August, 1920, his father died from senile dementia associated with arterio-sclerosis, and much of the nursing and control of the invalid revolved upon the son. The latter was an only child, greatly attached to the mother, but never on good terms with his father, whom he described as stern, strict, and unapproachable. Soon after the funeral the mother noticed that his pupils were unequal, and commented upon the fact. In this instance, the emotion was not that of unalloyed grief at the loss of a loved object.

"The second case was a girl of twenty-three, whose unequal pupils were noticed by the mother immediately after the death of her father.

"The third was a woman of thirty-eight. The difference in the

size of the pupils was seen by the sister on the first anniversary of the father's death, whilst leaving the shop at which they were buying a wreath to be placed on the father's grave, to which they were then going. The emotion shown by each of these two latter patients, during the recital of these circumstances, testified to the sincerity of the grief for the loss of the respective fathers. There were no other signs of derangement of the sympathetic nervous system. All three patients were in perfectly good health, as far as could be discovered."

Our own colleague, Dr. Jack I Kurtz, has also found in his wide and varied practice, ocular abnormalities due to emotional (functional) disurbances. In the year book of the American Academy of Optometry, Vol. IX, we find him reporting the following:

"Girl, age 11, well-developed, complained she cannot see to read. Her eyes were examined on several occasions and it was found that glasses would be of no assistance. The child was afterwards submitted to a thorough physical examination, which proved to be negative. Dr. Kurtz' examination on November 7, 1934, follows:

"External ocular examination negative, fundus negative, light reflex negative, accommodative reflex positive. The pupils were very large and contracted very good to light, but none at all to accommodation.

"Static Retinoscopy, O.D. + 0.75 D.S.; O.S. + 1.25 D.S.

"Dynamic Retinoscopy, O.D. + 3.00 D.S.; O.S. + 3.25 D.S.

"V.A. without lenses 20/20 O.U.

"Subjective O.U. + 0.25 D.S. O.U. V.A. — 20/20.

"6 Es. at distance and 10 at near. No vertical imbalance.

"Adduction, abduction and positive and negative reserve fusion convergence was normal. These findings were very constant upon three examinations on three different days. While her visual acuity for distance was quite normal, at near she could only read with difficulty the largest size of type of the near-point test card. Plus lenses did not improve her reading ability in any way. I was suspecting that she was malingering and a number of very exhaustive malingering tests were performed. These tests proved to our satisfaction that she was not malingering."

Dr. Kurtz had a private talk with the girl, developed confidence in her so that she might speak. The child informed him that last spring the teacher was mean to her and gave her a "terrible scolding in front of the entire class. Since then the children in her room were poking fun at her." Since that day she felt quite uncomfortable and was anxious to get away. In his conversation with the child, Dr. Kurtz assured her that matters could be made to please her, she could be transferred to another school or to another class-room in the same school, and that her eyes could be made comfortable that she should be able to read as other children do. Strange as it may seem she improved immediately and her prescription was O.D. + 0.75 D.S.; O.S. + 1.00 D.S. and was made in a Crookes A. At a later date her parents informed

him that the child goes to school regularly and is doing well. The doctor concludes, "* * * to me, it seems to be a definite functional abnormality which was caused by an emotional complex of fear and worry." The child's attempt to avoid her humiliation, but upon being promised to be transferred to another school, there was no further need of protest and she immediately saw clearly at near.

CLOSING REMARKS

1. The field of psychotherapy is still virgin ground and great discoveries lie in the future.

2. Throughout my thesis one cannot miss the all pervading principle that "mind" is dynamic, not centered in any definite organ of the body but rather manifested in the total activity of the organism, and that "illness" is basically of the nature of maladjustment in the economy of life, hence we find so much of the "re-educating technique" employed in Psychotherapy. The school of Dr. Alfred Adler considers e.g. "neurosis" in terms of a "false education," a wrong style or pattern of life. To make an individual healthy, therefore, means essentially to "re-educate" him to normalcy.

3. The question, how does an emotional disturbance express itself in organic symptoms, is not as yet thoroughly known. It is explained in the concept of the changeability of energy, similar to the change of water into ice or steam.

4. I do not advocate that Optometrists should become practicing Psychotherapists, but recommend that they recognize and profit from this field toward the perfection and enrichment of our own calling.

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A CLINICAL STUDY OF THE VALIDITY OF A NEW PROCEDURE FOR MEASURING VISUAL ACUITY*

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INTRODUCTION

The astronomers were among the first investigators to make any systematic observations upon the acuteness of vision. They were interested for the most part in the minimum visual angle subtended by distant constellations. As early as 1705, Hooke,[1] reporting his classical measurement concluded that two stars must be separated by 1 minute of arc in order that they may be seen separately by the eye. Donders,[2] almost a century later, gave a psycho-physiological impetus to the problem of measuring vision, by suggesting test-characters based upon a five minute angle. His pupil, Snellen,[3] developed and popularized this dictum so that today it is probably the most universally accepted and used of acuity determinants. Snellen's test-letters are constructed to subtend a five minute angle at a specified distance. The limbs and spaces between them are seen under an angle of one minute.

The form-sense, before the introduction of definite patterns, had a strictly physiological meaning insofar as it was limited to a measurement of the resolving power of the retino-cerebral system. It referred, specifically, to the positional relation of two disparate stimulations of the retina. However, with the emphasis being gradually placed upon perceptual patterns, it was necessary to modify and extend the original definition of visual acuity. In this reformulation must be included the interpretation of complex patterns which necessarily entails the addition of psychological factors. Considered as a totality visual acuity is now to be regarded as a measurement of the "minimum cognoscible" or "minimum legible." This broader concept, unfortunately, introduces a number of variables which are theoretically and practically undesirable. For example, experimental evidence[4] has been offered to show that the legibility of letters varies for a fixed distance.

Several modifications of the original Snellen type, including the Snellen "prong" and the illiterate "E" have been developed but they are of limited value. In 1909, the International Ophthalmological Congress[5]

*An abridgement of the material presented before the American Academy of Optometry at Chicago, Ill., August 24, 1936.

adopted the Landolt "broken-ring" test. This test employs an incomplete circle with a gap accurately calculated from a knowledge of the "minimum separable." The accuracy of this method has been questioned since it is possible to estimate the interruption in the continuity of the ring by intensity differences.

Wolffberg,[6] reasoning that the visual angle is a solid angle with a circular base, suggested graduated dots as test-objects, as they conform to this requirement. Within recent years, the Keystone View Co. has issued a series of visual acuity slides which in design differ but slightly from Wolffberg's system. In some respects these new slides are a unique departure from the more conventional tests in common use. Monocular acuities can be measured with both eyes fixing, and certain variable factors, characteristic of previous methods, are rigidly controlled. The possibilities of this test is the object of this report.

THE PROBLEM

The present experimental inquiry is concerned with the validity of the Telebinocular as an instrument for the determination of visual acuity. By validity is meant the fidelity with which it measures this function.

A survey of the literature, with one exception, proved sterile of any clinical verification of the accuracy of the above-mentioned instrument. The single reference is to be found in the descriptive booklet accompanying the apparatus. Because of the increasing number of practitioners adopting this technique, it became apparent that an investigation of its diagnostic value would be of interest. In evaluating validity it is usually customary to correlate the test in question with some independent criterion. For this purpose the Snellen test chart was employed. Admittedly, this criterion may have questionable value, but inasmuch as the Keystone test was developed from this standard, it was retained in order to be consistent with the previous work.

SUBJECTS:

In the conduction of this experiment, 439 subjects were selected. They comprised patients from the clinics of the Pennsylvania State College of Optometry, together with a number of senior internes from the same institutions. Stereopsis and sufficient vision to be within the range of acuities investigated, were prerequisite. Individuals possessing high degrees of uncorrected astigmatism (above 2 D.) were rejected as unsuitable for this preliminary experiment. Sex and age of the subjects, although recorded, required no separate classification and analysis.

APPARATUS:

The apparatus included a recent model Ophthalmic Telebinocular, manufactured by the Keystone View Co. In principle it is a modified and refined Brewster prism stereoscope. The optical system consists of mounted split halves of a plus 5 D. spherical lens to produce base-out effect. A cardholder is placed 8 inches from the lenses, the position being

indicated on the calibrated shaft. It is evident that at this distance the test-objects coincide with the focal plane of the lenses, presumably simulating the effect of distance vision. Three test cards (Db-1, 2 and 3) were used in the measurement of the monocular and binocular acuities. Each card comprises a stereoscopic duplication of 11 graduated crosses formed by 4 white squares arranged around a center square. Each cross contains a black dot of proportionate size. The slides for monocular determinations are dotted only for the eye being tested. Illumination is furnished by a 10 watt daylight bulb attached permanently to the instrument.

The remaining equipment consisted of an A.M.A. rating chart, printed by the Bausch and Lomb Co. The acuteness of vision, is conveniently expressed in terms of percentage visual efficiency derived from Scott Sterling's[7] mathematical treatment of the resolving power. The upper level of the chart was extended by adding two more rows (105 and 110%) to correspond with the range measurable with the Telebinocular. The object-card was artificially illuminated by a 60-watt daylight bulb. A suitably placed and shaped reflector permitted a uniform brightness level on the chart of 80 foot-candles. As no other light sources were present, lateral illumination was not a factor to be considered.

PROCEDURE:

The visual acuity of each subject was determined with the Telebinocular. Inasmuch as the arrangement of the dots for each card is different, the order of presentation is unimportant. The following directions were given to the subjects: "Each of the designs on the photograph before you may contain a black dot. Starting with the large design, indicate the location of each dot by the words, 'right,' 'left,' 'top,' 'bottom,' and 'center'."

The last correct reply was noted and the equivalent visual efficiency in percentile recorded. No guessing as to the location of the dots was permissable. The subject was cautioned that the dots must be seen. The perception of slight differences in the shading of a limb of the cross was not considered as a correct response.

The visual efficiency was then carefully taken with the A.M.A. rating chart. In each instance the poorer eye was tested first to lessen the possibility of committing the letters to memory. The vision of the better eye was then noted, and lastly that of both eyes together. The letters were individualized by singling them out with a pointer. This refinement concentrates the attention on a particular letter and favors the recording of higher acuities. It was arbitrarily decided that 75% correctness in response for a given line of letters constituted valid reason for allowing full credit to be granted. Partial credit would be difficult to evaluate as some letters are more legible than others on the same test line.

Because of the paucity of individuals at the lower acuity thresholds, it was necessary to render a number of the subjects artificially myopic in order to procure a sufficiently representative group at each level. It is to

be noted, however, that this procedure did not materially affect the test results. They were comparable in magnitude and direction to the data of subjects exhibiting true amblyopias.

DATA:

*Comparison of Two Methods at Different Levels of Visual Efficiency**

	Cases	Same	Higher	Lower	r	r (mod.)
			105% Level (20/15)			
Binocular	56	42	6	8	0.86	
Monocular	74	41	9	24	0.72	
			100% Level (20/20)			
Binocular	92	33	51	8	0.57	0.96
Monocular	146	71	48	27	0.68	0.96
			90% Level (20/33)			
Binocular	95	25	59	11	0.46	0.92
Monocular	179	63	83	33	0.55	0.95
			80% Level (20/45)			
Binocular	41	17	20	4	0.61	0.94
Monocular	104	43	37	24	0.59	0.95
			70% Level (20/60)			
Binocular	32	8	14	10	0.40	0.86
Monocular	62	25	17	20	0.58	0.88
			60% Level (20/75)			
Binocular	24	8	7	9	0.50	0.91
Monocular	62	17	24	21	0.43	0.90
			50% Level (20/100)			
Binocular	37	8	18	11	0.36	0.86
Monocular	71	15	15	41	0.37	0.85
			40% Level (20/122)			
Binocular	25	5	15	5	0.35	0.85
Monocular	61	28	23	10	0.64	0.95
			30% Level (20/150)			
Binocular	32	12	16	4	0.57	0.94
Monocular	58	20	21	17	0.52	0.95
			20% Level (20/200)			
Binocular	5	3	2	0	0.78	
Monocular	61	33	28	0	0.73	

*Using Snellen type as standard.

DISCUSSION OF RESULTS:

An analysis of the tabulated data reveals significant differences between the two techniques. In an examination of the binocular comparisons, 161 subjects showed a correspondence, 208 subjects a higher and 70 subjects a lower visual acuity. The monocular classification contains 356 subjects in agreement, 305 subjects a higher and 217 subjects a lower value than elicited by the test-standard. It is obvious that the Telebinocular readings, although spread in each direction, indicate a somewhat better visual acuity than the standard warrants. The characteristic scatter of the distribution would not be materially affected by increasing the difficulty of the test. The range, however, could be restricted by using trained subjects, and perhaps a more precise criterion.

The coefficient of correlation "r"[8] between the two systems, is extremely low for the different acuity levels, if the upper and lower limits are excluded. The percentage overlapping of the two methods may be obtained by squaring the correlation coefficient. If a variability of 10% is allowed, the tests correlate closely as indicated by the coefficient ranging from 0.85 to 0.96. A general inference, therefore, is that any inaccuracy of the Telebinocular is probably limited to a maximum deviation of 10%, if the same technique and procedure is adopted.

Extensive use of the Telebinocular visual acuity apparatus has served to emphasize certain advantages which it offers. The simplicity in construction and operation renders it especially suitable for children, illiterates and psychoneurotics. The test-letters in common use are usually satisfactory for the subjective determination of refractive errors. Nevertheless, the development of a more accurate and exact standard for measuring visual acuity seems imperative at this time.

SUMMARY AND CONCLUSIONS:

The present study was undertaken with the object of determining the comparative value and validity of an acuity apparatus recently made available to refractionists. Over 1300 comparisons were made using a criterion based upon the Snellen formula. The following conclusions appear warranted from the results of this investigation:

1. That the Telebinocular notations are not consistently in consonance with the Snellen acuity expressions, for the levels investigated.

2. That the Telebinocular technique tends to favor a better visual acuity than the conventional method, for either monocular or binocular determinations.

3. That if a clinical variation of 10% in the spread of the data is allowed, a reasonably close approximation to the visual acuity elicited by the criterion is obtained.

4. That further experimentation is necessary before it is possible to authoritatively assess the real value of this new method.

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THE GENERAL AND OCULAR FATIGUE PROBLEM

PART TWO[1]

1. Ocular Fatigue

A. The Relationship Between General and Ocular Fatigue

1. Most students of this subject contend that there is a distinct relationship between general and ocular fatigue, i.e., when general fatigue is present for fifteen minutes it begins to affect efficiency of ocular activity, and ocular fatigue begins to set in. The reverse may be equally true, that is, when ocular fatigue sets in first, it may gradually affect other parts of the body and thus becomes general.

2. Effects of Excessive Contraction Upon Ocular Efficiency

It is an established fact that excessive contraction of the accommodative muscles may produce asthenopia, or lower the visual acuity. A spasm of accommodation is usually considered to be the result of a contracture.

[1] Ocular Fatigue Problem. Part One. Amer. Jour. Optom. Vol. 14, No. 7, p. 273. 1937.

3. *The Effect of Work on a Fatigue Muscle*

"Mosso" in discussing the effect of work on a fatigued muscle gave the following laws of exhaustion: (a) The effect of work upon a muscle which is already fatigued is more harmful than a heavier task performed under normal conditions. (b) If a muscle like the flexor is completely exhausted it requires two hours to recover completely. If the muscle is only half-way exhausted, that is, if a muscle which is completely exhausted in sixty contractions is made to contract thirty times, then it takes only one-fourth of the time to recover, i.e., only half an hour and not one hour. This indicates that more energy is used in the last half of the work then in the first. (c) When a muscle becomes partly fatigued it feels relieved when part of its work load is reduced. (d) The intensity of fatigue of sensation is not at all proportional to the intensity of external causes which produce the fatigue. (e) The greater the excitability of a nerve the more quickly will it recover. (f) The interval between one effort and another should be longer when one is tired because his energy is restored less rapidly, because the excitability of the nerve and muscle had been reduced by fatigue. (g) The nervous energy sufficient to produce a strong contraction in a fresh muscle will not be sufficient to produce a contraction of equal strength in a fatigued muscle.

Spaeth[5] made a careful study of the fatigue problem and he arrived at this fatigue rule, i.e., that the height of the fatigue level varies invariably with the rapidity of the rhythm of contraction. For example, if after a muscle had contracted for six minutes at a rate $\frac{C}{R} = \frac{\frac{1}{2} \text{ sec.}}{3/2/ \text{ sec:}}$ the rhythm was then changed to the rate of $\frac{C}{R} = \frac{\frac{1}{2} \text{ sec.}}{19/2 \text{ sec.}}$ the muscle under the reduced rhythm promptly rose to its original level and remained there as long as this slow rate prevailed. C = contraction, R = rate of contraction.

Ocular fatigue, claims Mosso, follows the same laws as those of general fatigue with this difference that it is more difficult to determine the onset and progress of ocular fatigue.

4. *The Varying Energy Levels*

It had been observed repeatedly in practice that after a person had once become fatigued, as he continued to work due to some necessity it was found that the sensations of weariness suddenly passed away and in fact felt fresher than before. This is contrary to the physiological concept of fatigue and to the laws of fatigue. James tried to explain this phenomenon on the "varying energy level hypothesis." He claimed that there are different levels of energy, and when the fatigue limit of one level is reached another energy level is tapped. The demonstration of the existence

of varying energy levels by Cennon and others renders the correlation between output and fatigue extremely doubtful and probably invalid.

B. Types of Ocular Fatigue

In considering ocular fatigue one should bear in mind that there are several types of ocular fatigue, namely:

1. Accommodative
2. Convergence
3. Retinal
4. Central or brain fatigue

Accommodative fatigue is as the term implies, a fatigue of the accommodative mechanism and while this may be expected to develop mostly in presbyopic and prepresbyopic persons, it is also found amongst younger persons. This depends largely upon the type of an accommodative mechanism one possesses. Different technics have been used by various investigators to study this type of fatigue, some of these we shall discuss shortly.

Fatigue of convergence we may expect to find in cases of muscular imbalance and muscular insufficiencies. When there is a malfunctioning of the retinal elements, change in temperature, insufficient illumination, or excessive illumination and glare, retinal fatigue is likely to develop. Central and brain fatigue may be the result of faulty fusion faculty, suppression, anisikonia or excessive mental work.

It is not a simple matter to be able to differentiate the different types of fatigue, most often accommodative fatigue may be associated with convergence or retinal fatigue and vice versa.

1. Differential Diagnosis of Accommodative Convergence and Retinal Fatigue

To differentiate whether fatigue is of accommodative or retinal origin, Berens suggests the use of several methods. (a) Recede the test object farther away from the eyes, if it clears up then the fatigue is accommodative; if it remains blurred, then it may be considered to be of retinal origin. (b) If the addition of plus lens clears the blur then the fatigue is of an accommodative nature. (c) In applying the stenopaic hole disc if the test object remains blurred, the fatigue may be considered to be of a retinal nature; if on the other hand, when the disc is applied the blur of the object clears up, then the fatigue may be of the accommodative nature. (d) If applying the plus lenses or the stenopaic hole disc does not clear the type and applying prisms base in or out clears the blur, then the condition may be of fatigue of convergence.

C. Symptoms of Ocular Fatigue

There are very few definite and reliable symptoms which may be

claimed to be characteristic of ocular fatigue. Some of these may be divided into two general classifications:

1. Objective
   a. Inflammation
   b. Lachrimation
   c. Twitching of the lids
   e. Yawning
   f. Nystagmus
2. Subjective
   a. Headache
   b. Eyes ache
   c. Eyes feel tired
   d. Print fades out periodically
   e. Feeling of muscle strain
   f. Development of muscular disturbance
   g. Cannot concentrate
   h. Diplopia
   i. Feeling of pain all over the head
   j. Feeling of nausea
   k. Pulling effect on both temples which extends to the back of the head
   l. Photophobia

The symptoms just enumerated were produced by the writer experimentally in the laboratory while conducting an experiment to produce ocular fatigue. The experiment was conducted at the physiology department, medical school, University of Minnesota. Complete report of this experiment will be published in this Journal in the near future. It may be of interest to note at this point that while we were able to produce the objective and subjective symptoms in most of the subjects used in our experiments, we were able to get a quantitative measure of fatigue in only a few instances. In most of the cases it was impossible to detect any trace of fatigue in spite of the fact that they had the symptoms and feelings that accompany fatigue.

To measure ocular fatigue one meets many complications and finds it even more difficult then to measure general fatigue. Some of the methods used for testing ocular fatigue are:

1. Ocular Ergograph (Howe and Berens)
2. Blur test
3. Amplitude of accommodation test
4. Convergence test
5. Sensation of fatigue
6. Kurtz ophthalmographic technic.

The Howe Ergograph. This instrument was devised in 1912. It was his aim to develop an instrument which will measure fatigue of the non-striated muscle just as Mosso's ergograph measured fatigue of voluntary

muscles. Howe's 1912 model ergograph measured fatigue of convergence and his 1916 measured fatigue of accommodation. The original model was rather crude as may be seen from Figure 4. It had an horizontal bar upon which was fitted a sliding carrier, which held a test object. The carrier was attached to a string in such a manner that as it was moved

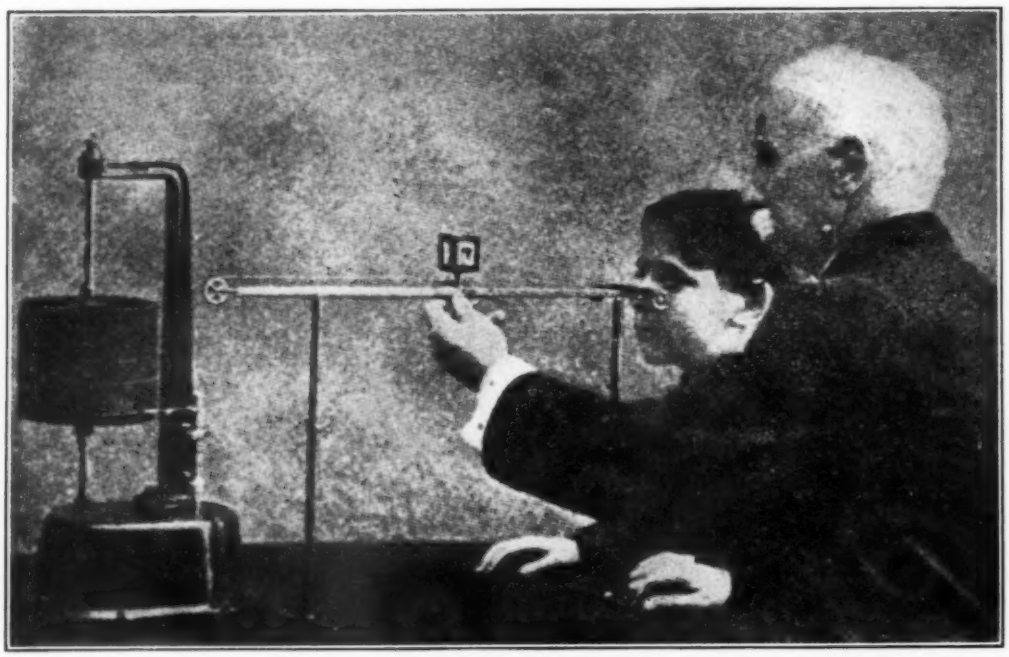

Figure 4

Figure 4. First accommodative ergograph by Howe. It will be noted that this experimenter manipulated the test object. The record was plainly seen by the subject. The test object and rate of movement was not standardized. (Courtesy Howe), from Amer. J. Ophth.

forward or backward a record of the position was immediately made upon a drum. The fatigue curves obtained by Howe closely resembled those of Mosso, as may be seen in Figure 5. Howe, in discussing accommodative fatigue, divided it into two classes:

1. Strong Type
   a. Strong through the entire effort.
   b. Strong through the first and second portion but not through the third.
   c. Strong contractions in first part only.
2. The Weak Type
   a. Contraction near normal in the first and second part and dis-

tinctly below normal in the last part.

b. Contractions nearly normal in first part only and distinctly weak in the second and third.

c. Contractions weak throughout.

While the curves of Mosso and Howe resembled each other (compare

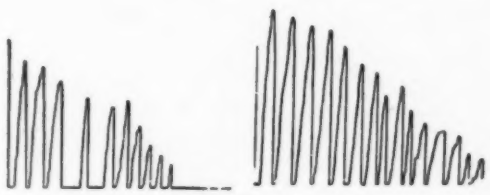

Figure 5

Figure 5 represents two accommodation fatigue records of normal eyes. (Howe).

Figure 2, July issue, page 279, with Figure 5 of this editorial). Berens continuing the work of Howe claims that the curves he obtained do not resemble the curves of Mosso or Howe.

A number of ergographs have been developed since Howe introduced his model. During this evolutionary process many improvements

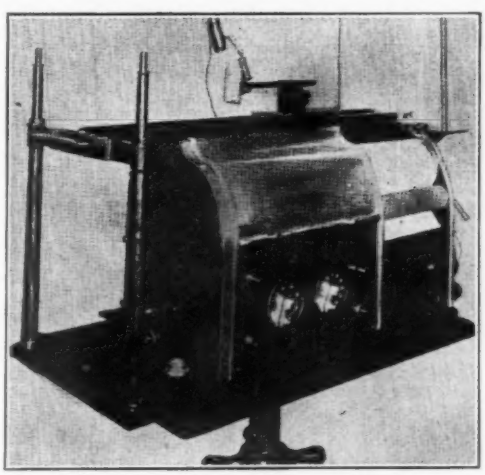

Figure 6

Figure 6. This is one of the latest models of ocular ergographs. It is possible to make a separate record of accommodation and convergence fatigue and to determine which function is affected first. The rest period is controlled by a timing device. The test object and the recording paper are activated by the same motor. Illumination is standardized.

have been made. Figure 6 represents the seventh ergograph model which records both convergence and accommodation. Here we have a controlled rest relaxation period. Both the test object and the recording paper are activated by the same motor. The illumination is standardized and the vibrations are eliminated. The rate of approach and recession of the test object are regulated and the mechanical features are very much simplified as all movements of the test object are controlled by pressing a button.

In studying fatigue of accommodation, Berens used two methods, the sustained and repeated effort tests. In the first test the object was kept as close to the eyes as possible. In the second test the test object was repeatedly brought to the near point. Berens claims that with his new ergograph it is possible to make a record of both accommodation and con-

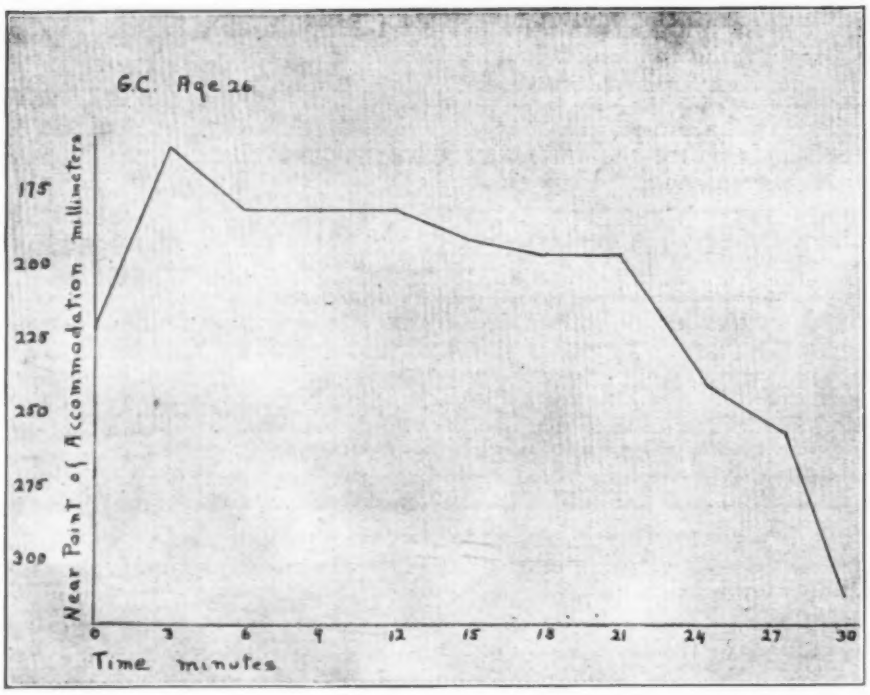

Figure 7

Figure 7. This cure is the result of the near point of accommodation tests taken every three minutes for half hour. The subject was reading fine print, which was held as close to the eyes as possible during the test period. (Method of Lancaster and Williams.)

Figures 4, 5, 6 and 7 are reproduced through the courtesy of the Amer. J. Ophthalmology and the Ophthalmic Publishing Co.

vergence fatigue and thus be able to determine whether fatigue sets in first in the accommodative or convergence mechanism.

The Blur Test for Fatigue. In this test a reading card with fine type is used to measure the near point and as it recedes there is an indication that fatigue set in. Lancaster and Williams[8] in their experiments used the blur method but they claim that they failed to get any noticeable degree of fatigue. Figure 7 is the fatigue curve obtained by these experimenters by making a near point accommodation test every three minutes for one-half hour.

The Amplitude of Accommodation Test. Here the amplitude is taken at the beginning and at the end of the test and if the amplitude is reduced at the end and it is an indication that fatigue set in.

Convergence Test. Here the convergence is measured at the beginning and at the end of the period, and if the convergence is reduced there is an indication that fatigue is present. Luckeish and Moss have constructed an automatic convergence ergograph and have used it extensively in their researches at the Nela Laboratories.

Sensation of Fatigue. Some investigators take the sensation of weariness or sleepiness as a criteria for fatigue. This River holds to be a most unreliable test because he claims that "in the performance of mental work especially, decided sensations of fatigue may be experienced when the objective record shows that increasing and not decreasing amounts of work are being done, and there may be a complete absence of any sensations of fatigue when the objective record shows that the work is falling off in quantity or quality or both." This is confirmed in the writer's experiment.

Kurtz Ophthalmographic Technic

This ophthalmographic test was performed in the following manner:

The subject was reading on a special test card and a photographic record was made at the start, and after using his eyes under exertion for thirty minutes, another photograph was made and the reading speed as given on the two records was compared. It was surprising to find that all experimental subjects showed a decrease in reading ability, ranging from five to twenty per cent, at the end of the experiment period of half an hour, while there was no decrease in accommodation amplitude or convergence when the other tests were applied.

After discussing the subject of general and ocular fatigue we again come back to some of the original questions (1) What is fatigue, (2) How can one measure it, (3) How can it be removed?

The definition of fatigue remains the same, i.e., reduced capacity for doing work. Applying this definition to the eye do we find a reduction in the capacity to do work in any of the component parts? Berens, who has done a great amount of experimental research on this problem, using the ergograph, finds that after using the eyes under extreme ex-

ertion that the amplitude of accommodation is actually increased in 28 per cent, remains constant in 40.5 per cent, and is somewhat decreased in 30.8 per cent. He also found no objective symptoms of fatigue in 69 per cent of the cases. This means that in almost 70 per cent of the cases there was no reduction in accommodation amplitude, and there were no objective fatigue symptoms present.

Other investigations revealed no decrease in the adduction power of the internal recti, nor in the positive fusion reserve. Now if it is so difficult to measure peripheral fatigue, how much more difficult is it to determine the existence of central fatigue. This being the case, it is inconsistent, unreasonable and unscientific to talk about unequal ocular fatigue patterns which can be equalized by the addition of a + 0.12 D.S. First we must be in a position to determine definitely whether ocular fatigue is present, next we should establish some dependable method of measuring the fatigue quantitatively. After this is once achieved we can next approach the subject of recovery.

E. Recovery from Fatigue

In order to understand how recovery from fatigue may be brought about it is important, first, to have a clear understanding about the factors which lead to the production of fatigue. This has been amply discussed in the preceding pages. In brief, it is the consumption of glycogen, the production of lactic acid, the increase in CO_2 and the reduction in oxygen. To recover from fatigue we should try to reduce the amount of lactic acid and CO_2 present and increase the oxygen supply.

There are two factors affecting the speed of recovery. (a) The total oxygen that can be taken in through the lungs into the blood and circulated by the heart. (b) The increase in the local circulation to the part involved. As optometrists, we are most interested in this second factor. This can be accomplished in several ways.

1. *Rest.* A resting muscle will tend to have the chemical equilibrium re-established.

2. *Emotional Activity.* Cannon claims that a great increase in muscular efficiency can be brought about by certain bodily changes during emotional activity. This can be accomplished in the following manner: Under the stress of emotional excitement and through the action of the sympathetic nervous system there is poured into the blood from the adrenal glands a secretion of adrenin, and Cannon claims that adrenin will do to the body in five minutes what rest will do in one hour. But right here we must be on our guard, while adrenin is the most efficient agent for the removal of fatigue we must not use it too extensively, we must not substitute adrenin in place of sleep and rest indefinitely.

3. *Ocular Exercises.* Various types of orthoptics of a stimulative nature will help remove fatigue substances and increase oxygen supply.

4. *Application of Heat.* This is the most efficient agent for the removal of fatigue. This can be applied in several ways. (a) Hot applications; (b) Application of infra-red radiations by using an infra-red lamp; (c) Application of diatermy or Tesla current, using a binocular electrode. These are most effective because their application can be localized to the eye. The blood circulation is accelerated, fresh blood and an increased oxygen supply is brought to the affected parts. (d) Correction of refractive error and muscular abnormalities. Jack I. Kurtz.

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* * * * *

SPECIAL REPORTS

YOUR PERSONALITY IN YOUR PRACTICE*

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South Royalton, Vermont

By now I can readily believe that you are thinking, "It's all very well for you to preach to us about 'love your fellow-man' and all that stuff—I have a family to support and I have to hustle and get all the money I can from every patient."

All right! We grant that optometry's travelling economist teaches us to concentrate on taking good care of the patient's eyes and let the patient guard her own pocketbook. We grant that money is essential. But I believe this is an experience meeting. I have been asked to bring and to pass on to you my observations and experiences in the hope that in them there might be a useful idea which you could use.

And I have found that the way to make money from the practice of optometry is to *forget money*. In other words, relegate to the back of your mind all thought of compensation or profit. Concentrate your entire

*An abridgment of the material presented before the American Academy of Optometry at Chicago, Ill., August 23, 1936.

efforts on making friends of every patient. Treat them as you would wish to be treated were you in their place. Look at the problem from their viewpoint. See how good a job you can do for them and do it at a conservative figure, a figure you yourself would accept as reasonable were you on the other side of your desk. If you do those things you will have patients come to you in such numbers that the money end of your practice will take care of itself. This is no idle dream—it works and I know it. Many days occur when I don't even have time to count the receipts. And perhaps a week goes by before I find time in which to bring my cash book up to date. Again I say, "Treat the patient as you would wish to be treated were you in their place," and the money end will take care of itself.

There are a great many ways in which you can carry out the program if you are sincere. The man who is sincerely desirous of helping his patients, of being thoughtful and considerate, of conserving their vision, their comfort, and their welfare, has a big order to fill. Let us begin at the start, even before the patient enters the building, and do some analytical thinking.

Your Patient's Comfort

Is the sidewalk suitable? Are there irregularities which tend to twist the ankle wearing a small heeled shoe? Mind you, we must begin to think of the patient's comfort, pleasure, and welfare from the time they come in sight. Scrutinize your sidewalk. If you own it yourself—fix it. If your landlord owns it and won't fix it—move to a building which does.

What is the outward appearance of your place? If a ground floor location, has it display windows and are there items of merchandise therein? If so, a thinking person will pass it up because here is ample evidence that the occupant's main line of thought is selling something; nobody wants to buy glasses—they want sincere and honest professional service— not glasses. Have not all these years the best half of the people gone to the less-trained eye, ear, nose, and throat specialist because they preferred a doctor to a merchant? This show-window argument does not apply to the offices of Academy members, but the thought *does* belong to you because it's a thought you must sell to an increasing number of your fellows back home—as Fred Andreae is doing.

How is your immediate entrance? Is it clean, well-lighted, and easy of access? How about your reception room? If it's like most I have seen, the best and easiest chairs are in your study or living room at home. Reverse the process; the office supports the home—not the home the office. Give your patients the best and they will provide you the best in turn.

Have you a clock on your reception room wall? If so, take it out. If you are thoughtful of a waiting patient you will not have a timepiece there to show them how slowly time can pass. Is the room cheerful and orderly? Does it reflect your personality as you would wish to have it reflected? You all know the stale joke about the year-old magazines

in the dentist's office. Make sure that yours are kept up to the moment. Provide them the best. Remember—you are to sincerely anticipate their wishes and to demonstrate that you are thoughtful and considerate of them in every possible manner. If possible you will have a toilet and drinking water accessible from your reception room. You yourself have walked the hot streets as do your patients. Go to the limit in being thoughtful of their comforts. In all things the patient comes *first*. And if you sincerely love and serve your patients you will air condition your office instead of buying yourself a new car.

Other Considerations

Do your office walls support any kind of so-called dealer-help display cards? Are there any other slightest bits of evidence that, now you have the patient in your office, you are still putting your interests first instead of his. If in any way you still think in terms of selling glasses instead of giving vision-care, these dealer helps will give you completely away. If you are sincerely interested in your patients and seek only to place their interests above your own you won't permit such things in your office. No—not even the neat little beribboned and sealed certificates which testify that you don't pass bad checks, and therefore such and such a manufacturer certifies as to your ability to sell their pet lenses. Can you ever imagine Parke-Davis certifying as to any physician's ability to prescribe their calomel; or S. S. White certifying that the dentist is licensed to sell their gutta-percha?

Is your office a model of comfortable and perfect artificial lighting? Can you show it to your patient as an ideal for him to follow in his own work at home? Are your rugs easy on their feet? Do you seat them beside your professional desk in consultation? Or have you still the old merchandising relic known as a fitting table? A fitting table is only a refined counter at best.

Even in otherwise professional offices I still frequently find the cash register. It has no place there. The doctor's money drawer is his pocket. The cash register is still emphasis on the point that the doctor's main aim in life is money-making. If you wish to segregate or classify your receipts you may do so easily on small slips of paper and toss them into the desk drawer or pigeonhole.

And lastly—does your professional equipment *dominate* the place? In a truly professional office; an office sincerely devoted to the care of human vision, the professional equipment will almost speak out loud. It will proclaim that the doctor's main work and deepest interest is the analysis and care of their eyes. There won't even be a pair of sample glasses in sight—they will be safely hidden. From floor to ceiling and from corner to corner your office reflects yourself. It is the background upon which you paint the picture of your professional personality. It talks out loud about you. You cannot silence its story.

Rely On Yourself—Not Your "Front"

In all thoughts and action put the patient's welfare first. But it will do little good if you just change the front, that is, the office. You will still be the same man. The thing to change is your own heart. Thoroughly imbue yourself with the idea that, beginning the moment you return to your office, you are going to absolutely give the patient the breaks; you will put their welfare first in all your thinking. If you will do that, all else will follow automatically. Work for the patient; forget your own selfish interest in the transaction. Every move you make and every sentence you utter proclaims your inward heart. If that heart is sincere, 100% sincere, the patient will sense it before your examination is completed. You won't have to do any selling. Stand them up, tell them you wish to study their stature, features, face, and complexion. Do so earnestly and faithfully. Then go to your desk and pick the one design they ought to have, tell them why, and the work is done. No bickering over price, no bantering, no quibbles.

What have you done? Sold a pair of glasses? No! You have sold *yourself*. And that, after all, is what a professional man has to sell. When his character and personality is so completely sincere, his inward grace so deep, his heart so true, and his desire to be helpful so earnest and capable, he cannot hide it. It permeates the air about him like the fragrance of a beautiful flower.

What if the doctor is insincere and does not possess these basic fundamentals of personal character? That, too, cannot be hidden. Selfishness fills the room and there is no beauty nor fragrance there.

And so, in the final analysis, whether you succeed or fail, it's not "the times," it's not your location, it's not the town, it's not your scholarly degrees (or lack of them). Neither is success dependent upon one's physiognomy or stature. Nor is it "luck." It's *you*.

"Well," you say, "if I am responsible, what am I going to do about it? How am I going to work when I get back so that I can practice as you suggest?"

One trouble with optometrists is that we are scared. We are so very sure that the eye-ear-nose and throat man has us up the tree that we expect to be licked. We cannot hide our emotions any more easily than we can hide our characters and no more sound rule exists than that when a man expects failure—he finds it. Keep yourselves in the mood of expecting success.

There are no fixed rules of practice. I cannot tell you what words you shall use nor tell you when and how to use them. Optometry is something more than learning a part like an actor, rehearsing it, and then staging the performance before every patient. Act no pose nor pretense. Be yourself.

The Optometric "Tree"

In discussing the subject matter of these talks with Dr. Melvin a

few weeks ago I mentioned that I could best carry the point were I to select some definite text and preach you a little sermon upon it. Mel hinted it might be well to avoid biblical texts, for some of us are not accustomed to such experiences. However, instead of giving you any definite rule of office practice, I wish to leave with you a few guiding thoughts. You are to adapt the ideas to your own individuality and in carrying them out, use your own words and expressions.

And the thoughts I wish to leave are all summed up nicely in the third verse from the First Psalm. Speaking of the upright and noble man, it says, "He shall be like a tree planted by the rivers of water, that bringeth forth his fruit in his season; his leaf also shall not wither and whatsoever he doeth shall prosper."

May we not liken our lives to a growing tree? What makes a tree grow? The chemist would stress the need of proper soil. The meteorologist would emphasize the requirement of favorable atmosphere. While the physicist would insist that no tree can live without sunshine, the philosopher goes back of scientific arguments and proclaims that trees need a properly balanced ratio of these three requirements, soil, atmosphere, and sunshine.

An optometric practice may be likened unto a tree. No one factor will insure its life and success. Skill and training is its soil; the office is its atmosphere; his personality is the sunshine in which final fruition of his efforts can only come.

Its Soil

Let us spend a few moments discussing each point. Skill and training is the soil. This covers the man's entire intelligence. The world judges a profession by its educational standards and attainment. But each acquaintance judges *you* by what you know *outside* of optometry. There is no need to state that you must do satisfactory work for your patients. One must needs love a man a lot to keep going back to an optometrist for new work every year or two if you cannot wear his corrections with comfort.

But though you do the best work in the world, if you be the 100% optometrist, if you can't talk sense in the fields of endeavor in which your patients are interested, you will find very few patients. Your skill is necessary. But outside broad and wide training is also important.

Please forgive me for making a personal reference. As I write this page late one evening I am interrupted by the ringing of my office bell. I find it to be a patient for whom new work was done a month previously, and whose mounting now requires a bit of additional and final rechecking.

To be sincerely interested in your patients means that you don't talk about yourself or your problems but rather do you forget self and enter fully into their interests and likes. The patient had just been to arrange for the entry of his race horse in a country fair. We talked

horses. From my wide range of studies I was able to tell him the history of the horse and how it had been traced in an unbroken chain from a small four-toed animal the size of a husky tom-cat fifty million years ago up to the present one-toed and large size animal. He left reluctantly and not until he had arranged appointments for two of his employees.

Nobody has been a bigger fool than I have been. I've made more mistakes than any other living man and I still make a lot of them. But there is one mistake I don't make any more, and that is the mistake of ignoring the patient and his likes. When patients tried to talk golf or fishing I used to shut them up with a wise crack that golf was "cow pasture pool" and that fishing was a reversion to savage type and harked back to the days when man had to fish for a living. While I don't fish, hunt, nor play chess, I can talk intelligently with patients on most of the subjects they can bring up. If you talk only to show off how much you know you will repel your patients; but if you talk because of a sincere interest in them and their likes you will attract them.

I believe that the true professional man is one who has a specialized training on top of a larger than average amount of general information. In other words, pick the cream of the crop and then train him for his profession. He should be a man, as well read and as intelligent as any of his patients. He should know his work well and have a conversational acquaintance with all of the differing kinds of work and hobbies in which his patients are engaged. This is my ideal of a professional man. I fall far short of it myself—but it is still my ideal and daily I feel that I approach it a little nearer though I shall never reach it.

Its Atmosphere

The asmosphere in which the tree of optometric practice grows is your office and its environment. Just as vegetation flourishes best in a warm and congenial atmosphere so will your practice flourish if you extend to your patients a warm and congenial welcome. Plant life stops at the freezing point. So does the arrival of patients. If you treat them coldly your practice dies.

It is unnecessary here to go into details of office equipment and arrangement. You to whom I am speaking are the leaders in our profession. Your offices closely approach the ideal. Again I state—*Your office is the background upon which you paint the picture of your professional personality.*

Its Sunshine

But though the soil and atmosphere be suitable, our tree will never come to maturity and fruition without the sunshine of a lovable personality. In my first paper I discussed that point at considerable length.

It has been my good fortune to have read dozens of books dealing with human nature. I too used to feel that success was simply the knack of discovering the proper rules of the game and of properly "playing the part." If you touched the proper key the patient would open up and

leave his money and his good-will; like you were opening a cash-drawer or a safe. But success does not come that way.

All of those books sum themselves up into just one rule, if you wish to call it a "rule," and it is this—Do not injure the other fellow's ego; if possible, strengthen and help him to maintain it. Call it tact, gentleness, thoughtfulness, sympathy or fellow-love; it is all the same. Though we have the gift of prophecy and though we have all knowledge and ability but have not charity—we are nothing.

Nothing flatters a patient as much as that you should be interested in the things which interest him. Your interest should be genuine and your questions should display a respect for the other's knowledge. Ask their opinions. Give them a little compliment when you can do so tactfully. The best compliment of all is one given of another behind their back to a third person.

In closing, let me urge you to consider this inflexible rule. Whenever a patient or a prospective patient comes in contact with you, your office or your assistants, make sure that the patient is made *happier* as a result of the contact. Exercise the art of cheerfulness and see to it that every patient leaves with a smile as they go out your door. Make them happier for having called upon you.

May I leave you with this quotation from Carlyle:

"There is no greater every-day virtue than cheerfulness. This quality in man among men is like sunshine to the day, or gentle renewing moisture to parched herbs. The light of a cheerful face diffuses itself, and communicates the happy spirit that inspires it. Efforts to be permanently useful to others must be uniformly joyous and cheerful—a spirit all sunshine, graceful from very gladness, beautiful because bright."

DR. LAURENCE P. FOLSOM,
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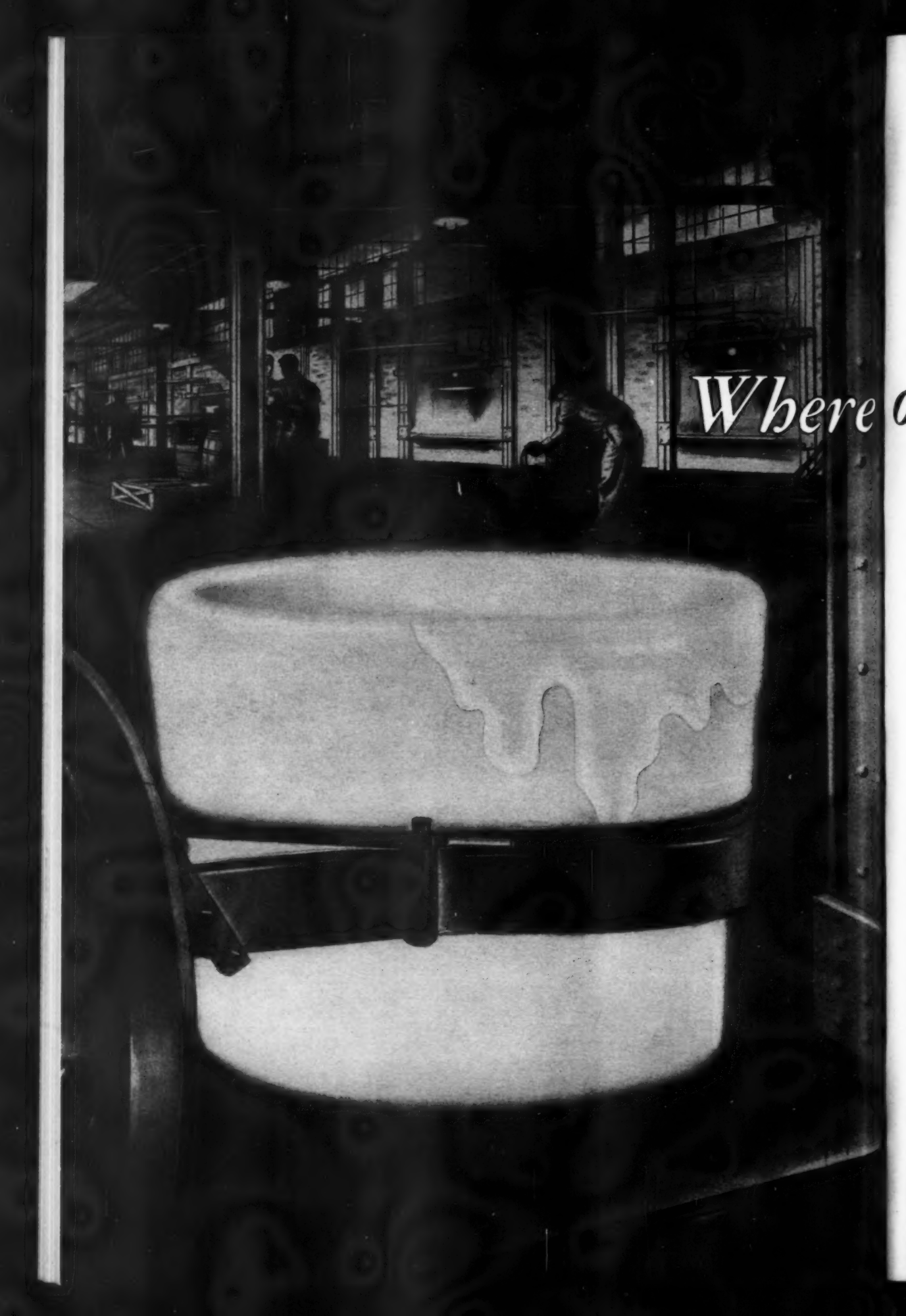
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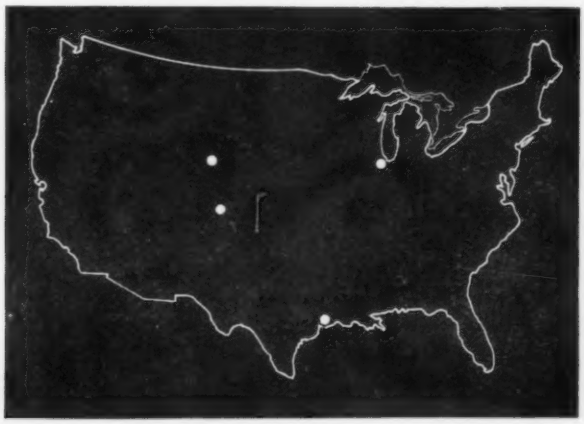

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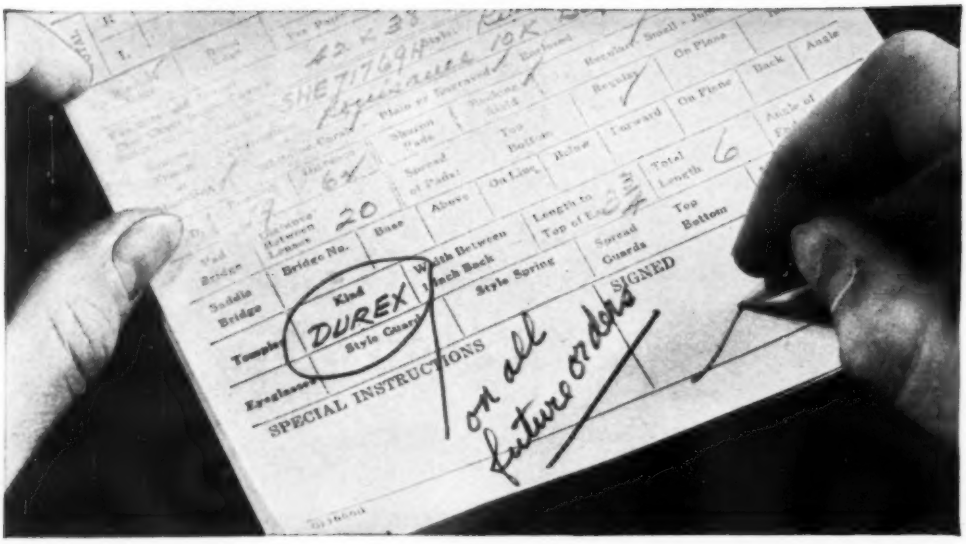

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